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# State of California AIR RESOURCES BOARD

# EXECUTIVE ORDER U-R-35-11 Relating to Certification of New Off-Road Compression-Ignition Engines

#### MITSUBISHI HEAVY INDUSTRIES, LTD.

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-45-9;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engine and emission control system produced by the manufacturer are certified as described below for use in off-road equipment:

Model Year: 2001

Typical Equipment Usage: Tractor

Fuel Type: Diesel

	Engine		
Engine Family	Displacement		Emission Control Systems
	(liters)	(hours)	and Special Features
1MVXL02.5AAA	2.3 and 2.5	5000	Indirect Diesel Injection

Engine models and codes are listed on attachments. Production engines shall be in all material respects the same as those for which certification is granted.

The exhaust emission certification standards and certification values for hydrocarbons (HC), oxides of nitrogen (NOx), or non-methane hydrocarbons plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) (units are expressed in grams per kilowatt-hour (g/kw-hr)), and the opacity-of-smoke certification standards and certification values in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family are as follows (Title 13, California Code of Regulations, Section 2423):

Engine Power	Emission Standard		Exhaust Emissions (g/kw-hr)					Smoke	Smoke Opacity (%)		
Rating (kw)	<u>Category</u>		<u>HC</u>	<u>NOx</u>	NMHC+NOx	<u>CO</u>	<u>PM</u>	Accel	Lug	Peak	
19 <u>&lt;</u> KW<37	Tier 1	Standard	N/A	N/A	9.5	5.5	0.80	20	15	50	
		Certification			5.5	1.2	0.34	4	5	7	

BE IT FURTHER RESOLVED: That the listed engine models also comply with "Emission Control Labels— 1996 and Later Off-Road Compression-Ignition Engines" (Title 13, California Code of Regulations, Section 2424) for the aforementioned model-year.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the materials to demonstrate certification compliance with the Board's emission control system warranty provisions (Title 13, California Code of Regulations, Sections 2425 and 2426).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

Executed at El Monte, California this

day of February 2001.

રે. B. Summerfield, Chief

Mobile Source Operations Division

### ATTALHMENT

## Engine Model Sun. .ary Form

Manufacturer:

Mitsublshi Heavy Industries, Ltd.

Engine category:

Nonroad CI

EPAEngine Family: 1MVXL02.5AAA

Mfr Family Name:

Process Code:

**New Submission** 

U-R-35-11

1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J193
\$4Q-Y161DG	S4Q	33.3hp@1800	35	13.8		<u> i - i - i - i - i - i - i - i - i</u>	<u> </u>	
S4Q2-Y161DG	S4Q2	36.0hp@1800	37	14.8				
S4Q2-Y161DP	S4Q2	49.3hp@2500	38	21.1	107ft-lb@1800	37	14.7	TDI, EM
\$4Q-Y181GT	S4Q	41.5@2600	32	18.2	92.6@1600	33.5	11.7	July EIVI
S4Q2-Y161GT	\$4Q2	46.5@2700	34.5	20.4	99.8@1600	36.3	12.9	
S4Q-Y161DP	S4Q	46.0hp@1800	36	20.0	98ft-lb@1800	35	13.9	
S4Q2-Y162SD	\$4Q2	36.0hp@1800	37	14.8		:	10.5	
S4Q2-Y162KL	S4Q2	44.5@2200	38	18.3	107@1800	37	14.7	
\$4Q-Y165DG	S4Q	33.3hp@1800	35	13.8			[4,]	
S4Q-Y165DP	S4Q	46.0hp@2500	36	20.0	98ft-lb@1800	35	13.8	
S4Q2-Y165DG	S4Q2	36.0hp@1800	37	14.8	3511.15(8) 1000		13.0	
S4Q2-Y165DP	S4Q2	49.3hp@2500	38	21.1	107@1800	37	14.6	
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